User's Manual

LCD PROGRAMMER

(A6HGPE)

A Series
Programmable
Controllers

MITSUBISHI

Cat. No. UMLP

INTRODUCTION

Thank you for your purchase of Mitsubishi General-Purpose Programmable Controller MELSEC-A. Prior to use, please read this User's Manual carefully to fully understand the functions and performances of the A series programmable controller and also to use it correctly.
Please forward this User's Manual to the end user.

CONTENTS

1. GENERAL DESCRIPTION . . . . . 1-1 ~ 1-2

2. NOMENCLATURE AND HANDLING . . . . . 2-1 ~ 2-4

2.1 Keyboard and Display 2-1
2.1.1 Display panel viewing angle adjustment 2-2
2.1.2 Use of the floppy disk (FD) 2-2
2.1.3 Use of the memory card 2-2
2.2 Connectors and Interface Sockets 2-4

3. SPECIFICATIONS . . . . . 3-1 ~ 3-5

3.1 General Specifications 3-1
3.2 Performance Specifications 3-2
3.3 Hardware Information 3-3
3.3.1 Keyboard specifications 3-3
3.3.2 LCD specifications 3-3
3.3.3 Floppy disk drive (FDD) specifications 3-4
3.3.4 RS-232C interface specifications 3-4
3.3.5 RS-232C connector pin-outs 3-4
3.3.6 RS-422 interface specifications 3-4
3.3.7 RS-422 cable specifications 3-5
3.3.8 Power fuse specifications 3-5

4. HARDWARE SELF-CHECK 4-1

4.1 A6HGP Hardware Check Procedure 4-1

APPENDICES . . . . . APP-1 ~ APP-3

APPENDIX 1 General Use APP-1
APPENDIX 2 External Dimensions APP-3

1. GENERAL DESCRIPTION

The A6HGPE handy graphic programmer (referred to as "A6HGP") is a peripheral unit for use with MELSEC-A and K series PCs. It is based on a 16-bit microprocessor and features many useful functions as well as ease of operation. This Manual describes the A6HGPE hardware. For operating instructions, consult the relevant operating manual for the system being used.

A6HGPE features:

1) Light weight and portable.
2) A large liquid crystal display (referred to as "LCD") screen allowing easy program writing and correcting.
3) A built-in 3.5-inch floppy disk drive (referred to as "FDD") for program storage.
4) The operating systems for A and K series programmable controllers are stored on separate disks allowing great flexibility.
5) The RS232C port allows the printing out of ladder and list diagrams as well as cross reference lists, etc.
6) By connecting the A6HGPE to a ROM writer (A6WU) using the RS-422 cable, programs and comments can be stored onto ROM.

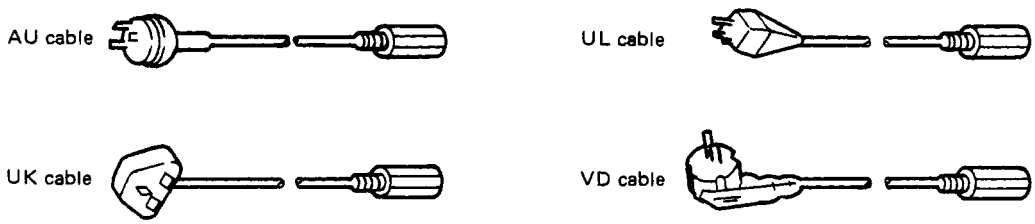
Table 1.1 shows all the components included in the A6HGPE-[ ]-SET.

Description	Name		Quantity	Option
Main unit	A6HGPE *Four types of A6HGPE are prepared refer to Table 1.2.		1	–
RS-422 cable	AC30R4 (3m length)	(For connection with PC CPU)	1	○
	AC300R4 (30m length)		–	○
	AC03WU (0.3m length, for connection with A6WU)		–	○
RS-232C cable	AC30R2 (3m length, for connection with printer)		–	○
Floppy disk	SW1-HGPK (for MELSEC-K series start-up)		1	○
	SW2-HGPA-1	(for MELSEC-A series start-up)	1 each	○
	SW2-HGPA-2			
	SW0-GPPU (for user, already formatted)		1	○
	SW0-FDC (for cleaning)		–	○
Manual	A6HGP Operating Manual (for SW1-HGPK)		1	○
	A6HGP Operating Manual (for SW2-HGPA)		1	○
Memory card	A6MEM2-HGPA-1 (For MELSEC-A series start-up. Same functions as SW2-HGPA-1)		–	○

Table 1.1 A6HGP Components

Model	Destination	Voltage (50/60Hz ±2Hz)	Cable
A6HGPE-220VD	W. Germany Sweden Norway Austria	(200–240V) $^{+10}_{-15}$ %	VD cable
A6HGPE-240UK	Great Britain	(200–240V) $^{+10}_{-15}$ %	UK cable
A6HGPE-115UL	United States	(100–120V) $^{+10}_{-15}$ %	UL cable
A6HGPE-240AU	Australia	(200–240V) $^{+10}_{-15}$ %	AU cable
A6HGPE-115UL	Taiwan	(100–120V) $^{+10}_{-15}$ %	UL cable
A6HGPE-115UL	Korea	(100–120V) $^{+10}_{-15}$ %	UL cable
A6HGPE-220VD		(200–240V) $^{+10}_{-15}$ %	VD cable

Table 1.2 Types of A6HGPE

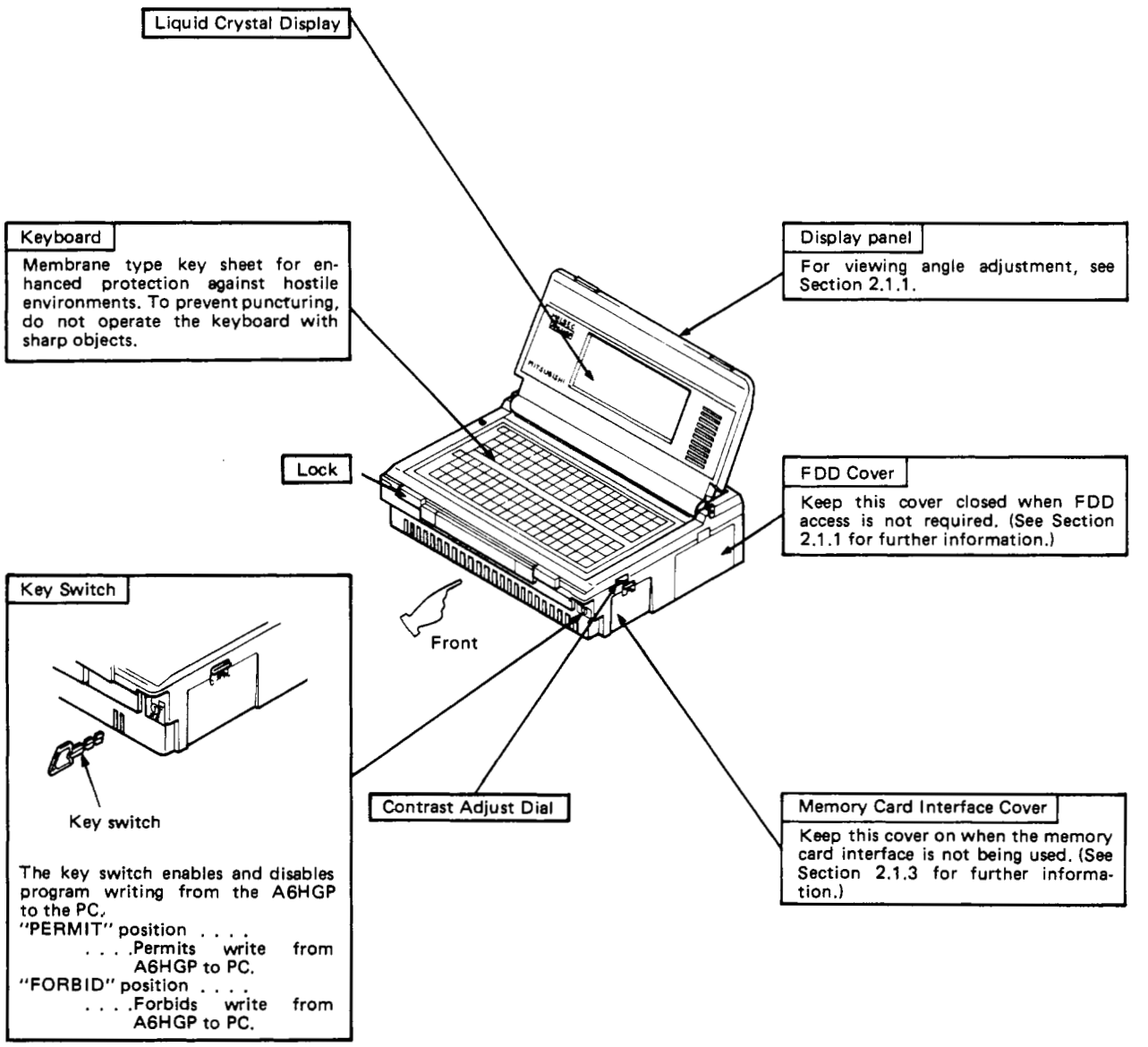


Note: The length of each cable is 2.5m.

2. NOMENCLATURE AND HANDLING

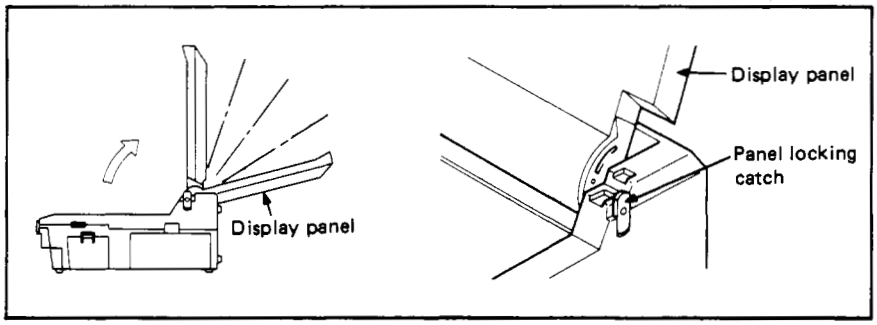
2.1 Keyboard and Display

Note: FDD refers to Floppy Disk Drive.


Liquid Crystal Display
Keyboard
Membrane type key sheet for enhanced protection against hostile environments. To prevent puncturing, do not operate the keyboard with sharp objects.
Display panel
For viewing angle adjustment, see Section 2.1.1.
Lock
FDD Cover
Keep this cover closed when FDD access is not required. (See Section 2.1.1 for further information.)
Key Switch
Key switch
The key switch enables and disables program writing from the A6HGP to the PC.
"PERMIT" position . . . .
. . . .Permits write from A6HGP to PC.
"FORBID" position . . . .
. . . .Forbids write from A6HGP to PC.
Front
Contrast Adjust Dial
Memory Card Interface Cover
Keep this cover on when the memory card interface is not being used. (See Section 2.1.3 for further information.)

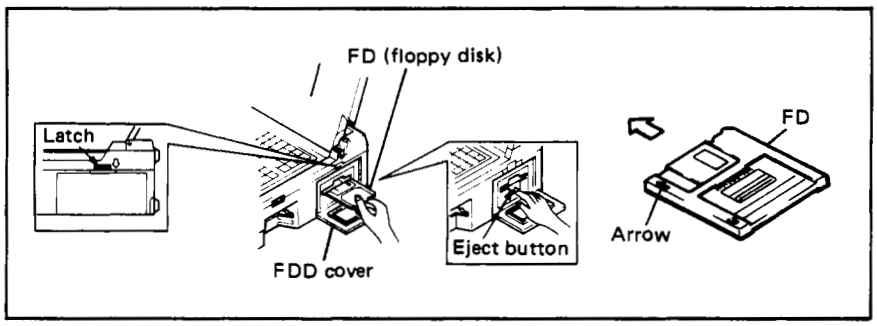
2.1.1 Display panel viewing angle adjustment

The display panel is opened by sliding the two attache case style locks and raising the lid. The viewing angle may be adjusted by pushing the panel locking catch to the right.
Before closing the display panel, push the panel locking catch to the right.
Handle the display panel with care to prevent damage to the LCD. Ensure that the display is locked in position during use.



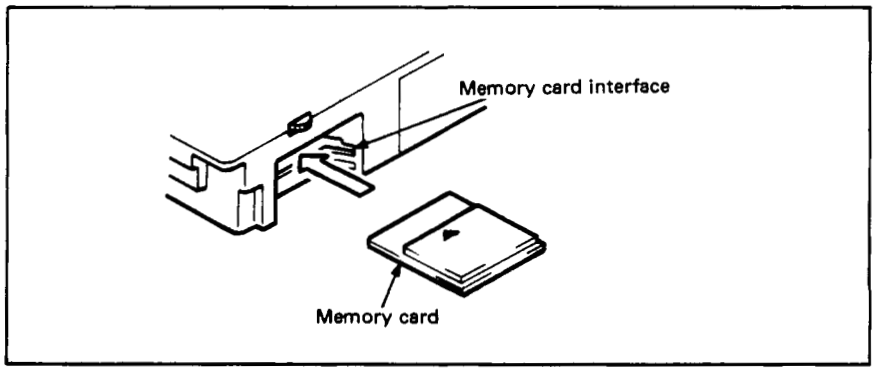
2.1.2 Use of the floppy disk (FD)

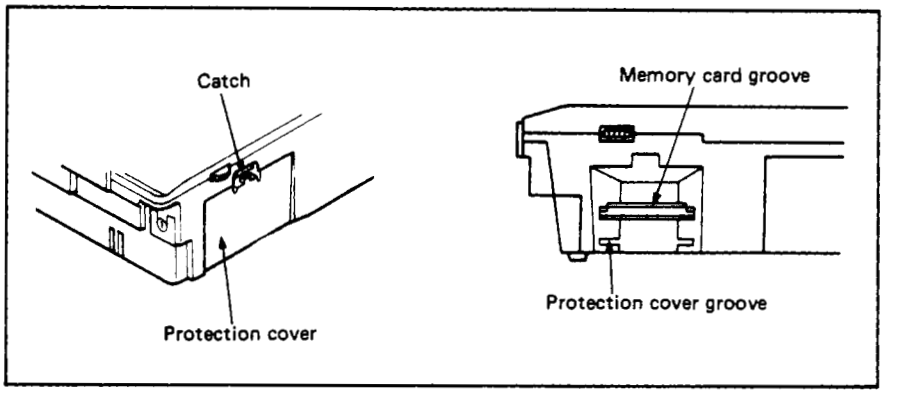
Open the FDD cover by pressing the catch in the direction indicated by the arrow. Insert the FD with the arrow facing upwards.
To remove the FD, press the eject button.



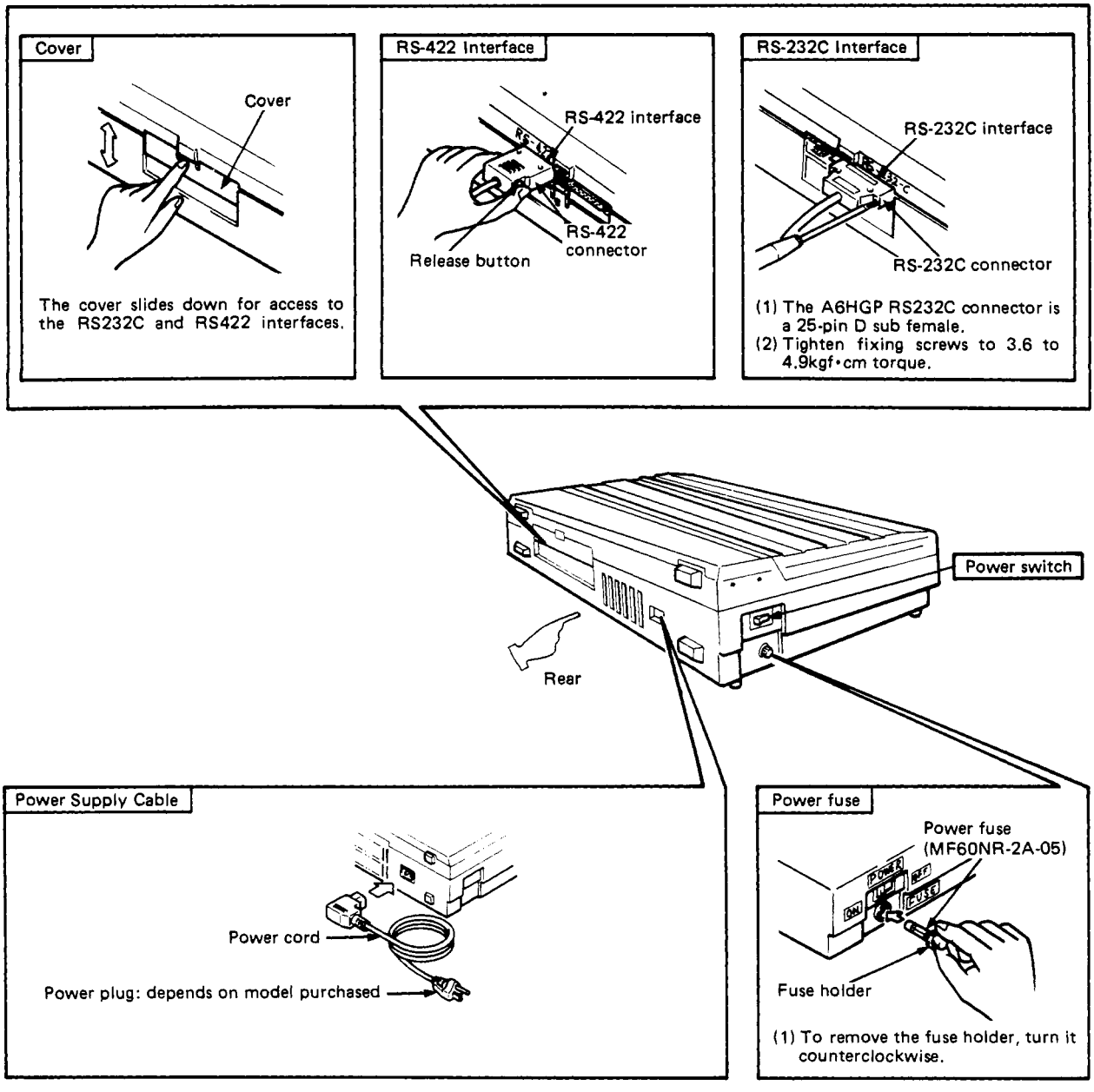
2.1.3 Use of the memory card

Remove the memory card interface cover by pressing the catch. Insert the memory card as indicated in the diagram below.
Always replace the protective cover when access to the memory card is not required.




Catch
Protection cover
Memory card groove
Protection cover groove

2.2 Connectors and Interface Sockets



3. SPECIFICATIONS

3.1 General Specifications

<table>
<tr><th>Item</th><th colspan="4">Specification</th><th>Condition</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="4">10°C to 40°C</td><td>W</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="4">−10°C to 45°C</td><td>W/O</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="4">10 to 90% RH (non-condensing)</td><td>W/O</td></tr>
<tr><td>Storage ambient humidity</td><td colspan="4">10 to 90% RH (non-condensing)</td><td>W/O</td></tr>
<tr><td rowspan="4">Vibration resistance</td><td rowspan="4">Jap ind. std.</td><td rowspan="2">Oscillation frequency</td><td colspan="2">Acceleration amplitude</td><td rowspan="4">W</td></tr>
<tr><td>When operated</td><td>When not operated</td></tr>
<tr><td>10 to 55Hz</td><td>0.035mm</td><td>0.075mm</td></tr>
<tr><td>55 to 150Hz</td><td>0.5G</td><td>1G</td></tr>
<tr><td>Shock resistance</td><td colspan="4">Conforms to JIS C 0912.
(10g x 3 times in X, Y, and Z directions)</td><td>W/O</td></tr>
<tr><td>Dielectric withstand voltage</td><td colspan="4">1500V AC for 1 minute across batch of AC external terminals and case</td><td>W/O</td></tr>
<tr><td>Insulation resistance</td><td colspan="4">5MΩ or larger by 500V insulation resistance meter across batch of AC external terminals</td><td>W/O</td></tr>
<tr><td>Grounding</td><td colspan="4">Class 3 grounding.</td><td>W</td></tr>
<tr><td>Operating Environment</td><td colspan="4">No corrosive gases and dust should be minimal.</td><td>W</td></tr>
<tr><td>Cooling method</td><td colspan="4">Self-cooling</td><td>W</td></tr>
<tr><td>Allowable instantaneous power failure time</td><td colspan="4">10ms</td><td>W</td></tr>
</table>

Above specifications apply with (W) or without (W/O) Floppy Disk installed as indicated.

Table 3.1 General Specifications

3.2 Performance Specifications

Item		Performance Specifications
Line voltage		Depends on type purchased, see Table 1.2 page 1-2. Frequency 50/60Hz±2Hz.
Current consumption		Maximum 1A
Internal memory capacity		1M byte (960K bytes available for user)
Display area		LCD (with back light)
Display	Graphic display	640 x 200 dots
	Number of displayed characters	80 characters x 25 lines
	Types of characters	Alphanumeric characters, special characters/symbols
Keyboard		165 keys, key sheet type • GPP mode keyboard • MELSAP mode keyboard
Floppy disk drive		o Equipped with 3.5 inch floppy disk drive o Floppy disk capacity 1M bytes*
Interfaces	RS-422 I/F	o Conforms to EIA. RS-422 o For connection with MELSEC-A or K series programmable controllers o For connection with A6WUE
	RS-232C I/F	o Conforms to EIA. RS-232C o For printer
Memory card interface		For operating system memory card
External dimensions (mm) (inch)		113(H) x 380 (W) x 270 (D) 4.45(H) x 14.96(W) x 10.63(D)
Weight (kg) (lbs.)		Approx. 5.5 Approx. 11

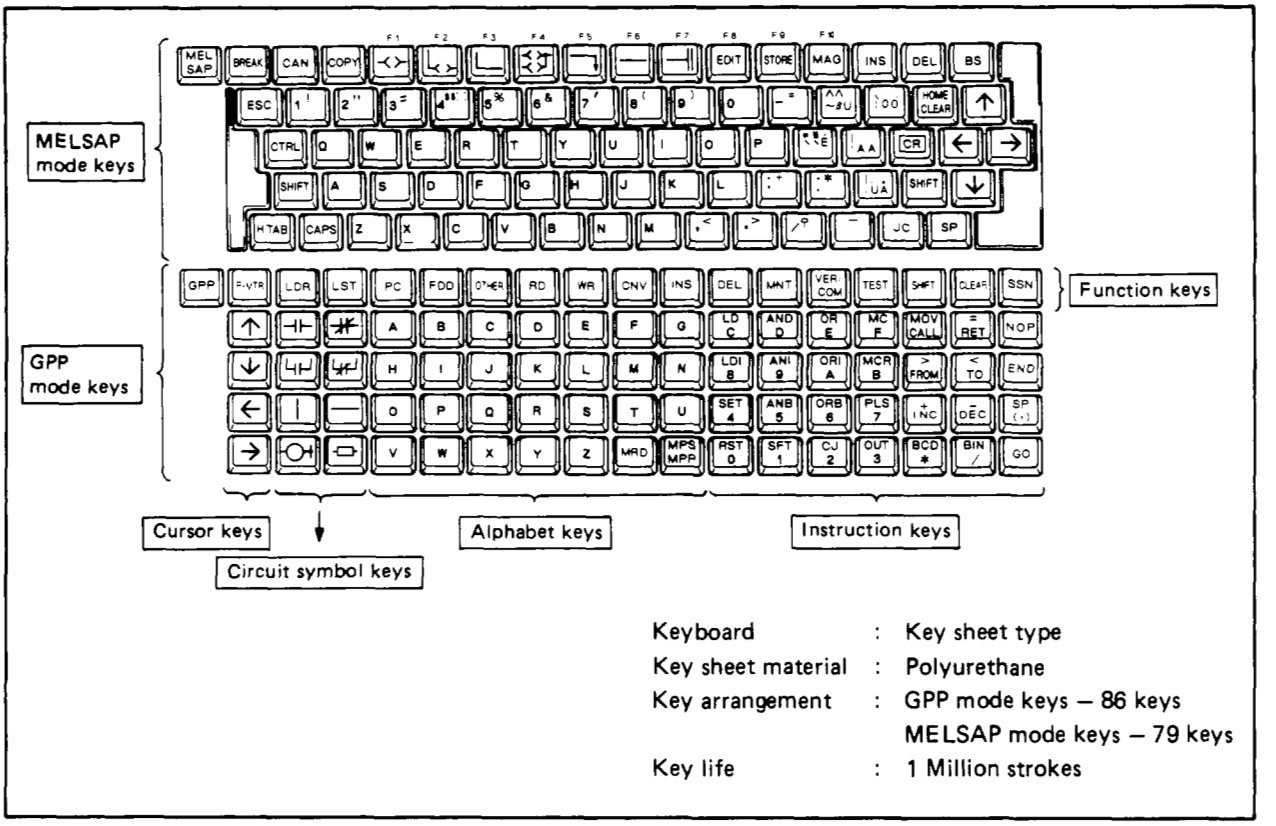
Table 3.2 Performance Specifications

REMARKS

*: 640K bytes (after formatting).

3.3 Hardware Information

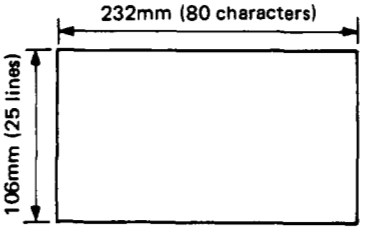
3.3.1 Keyboard specifications



Keyboard	:	Key sheet type
Key sheet material	:	Polyurethane
Key arrangement	:	GPP mode keys – 86 keys MELSAP mode keys – 79 keys
Key life	:	1 Million strokes

Table 3.3 Keyboard

3.3.2 LCD specifications



Display Area Size	Item	Specifications
	Ground color	Pale blue
	Dot color	Dark blue
	Ladder display	(11 contacts + 1 coil) x 8 stages
	List display	16 lines
	Comment display	16 lines
	Number of characters	80 characters x 25 lines
	Display format	640 x 200 dots

Table 3.4 LCD Specifications

POINT

LCD contrast is adjustable.

3.3.3 Floppy disk drive (FDD) specifications

Item		Double-Density Recording
Recording capacity	Unformatted	1.0M bytes
	Formatted	640K bytes
Application		○ For A6HGP operating system ○ Program storage etc.

Table 3.5 Floppy Disk Drive (FDD) Specifications

3.3.4 RS-232C interface specifications

Item	Specification
For connection with	Printer with RS232C interface
Transmission mode	Conforms to EIA. RS-232C
Synchronous mode	Asynchronous mode
USART mode setting	Set in printer mode
Connector	25-pin D-sub(female) screw fixing type

Table 3.6 RS-232C Interface Specifications

3.3.5 RS-232C connector pin-outs

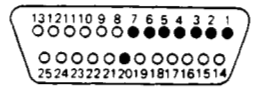
Pin Arrangement	Pin Number	Signal Symbol	Direction A6HGP ↔ outside	General
	1	FG		Frame ground
	2	SD	→	Transmit data
	3	RD	←	Receive data
	4	RTS	→	Request to send
	5	CTS	←	Clear to send
	6	DSR	←	Data set ready
	7	SG		Signal ground
	20	DTR	→	Data terminal ready

Table 3.7 RS-232C Connector Pin-Outs

3.3.6 RS-422 interface specifications

Item	Specification
For connection with	○ MELSEC-A or K series programmable controllers ○ A6WUE (ROM writer)
Transmission mode	Conforms to EIA. RS-422
Synchronous mode	Asynchronous mode
Transmission speed	9600 BPS
USART mode setting	Automatically set by OS
Connection cable	AC30R4, AC300R4, AC03WU

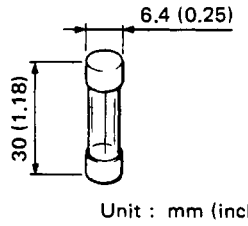
Table 3.8 RS-422 Interface Specifications

3.3.7 RS-422 cable specifications

Item	Specification		
	AC30R4	AC300R4	AC03WU
Connected units	For connecting A or K series PC		For connecting A6WU
Dielectric withstand voltage	500V AC for 1 minute		
Length m (inch)	3 (118)	30 (1181)	0.3 (11.8)
Weight kg (lbs.)	0.5 (1.1)	5 (11)	0.13 (0.29)

Table 3.9 RS-422 Cable Specifications

3.3.8 Power fuse specifications



Unit : mm (inch)

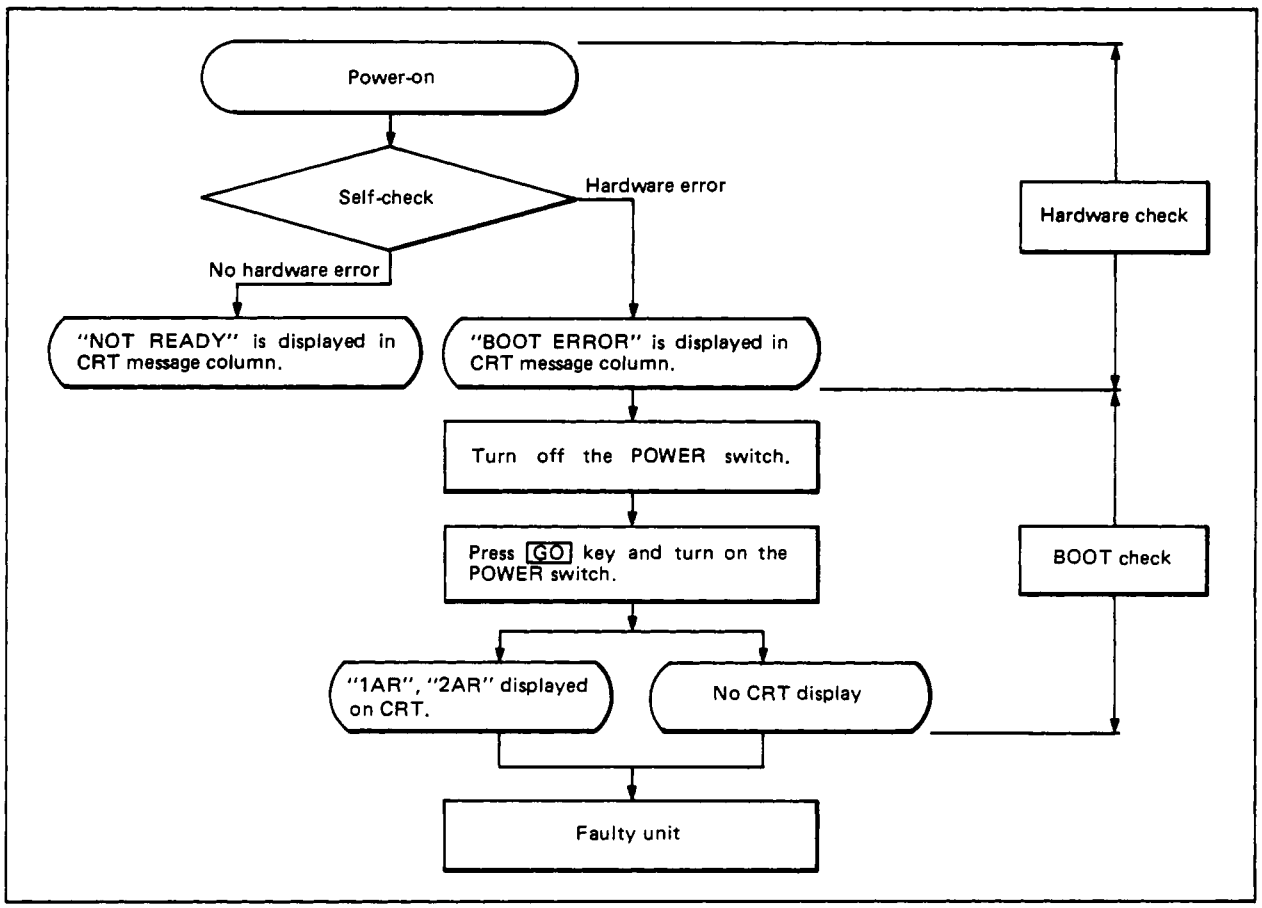
Item	Specification
Type	MF60NR-2A 05 (cartridge fuse, 250V AC rating, 2A current rating)
Standard	JIS C 6575 (Class B)

Table 3.10 Power Fuse Specifications

4. HARDWARE SELF-CHECK

A hardware self-check can be executed by powering up the HGP without a system FD installed.

4.1 A6HGPE Hardware Check Procedure



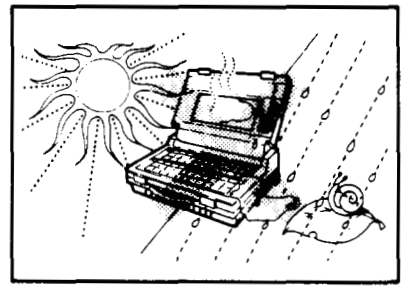
REMARKS

Boot check error messages are as follows:

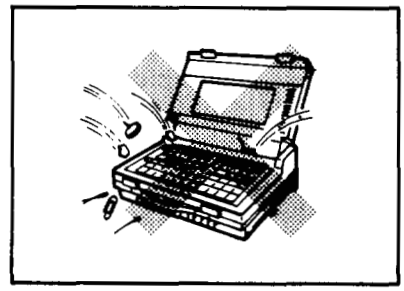
(a) "2AR" . . . . . .FDD fault
(b) No display . . . . .A6HGP hardware fault

APPENDICES

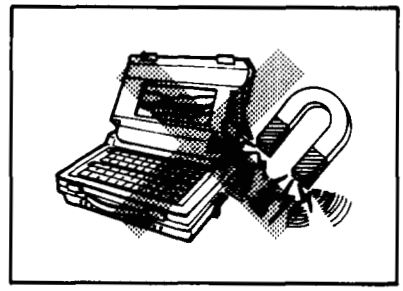
APPENDIX 1 General Use



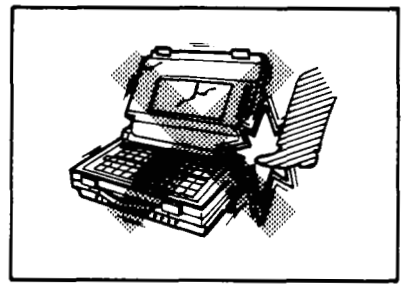
Do not subject the unit to high temperature or humidity.
Operating ambient temperature:
10°C to 40°C
Storage ambient temperature:
−10°C to 45°C
Operating/storage humidity:
10 to 90% RH



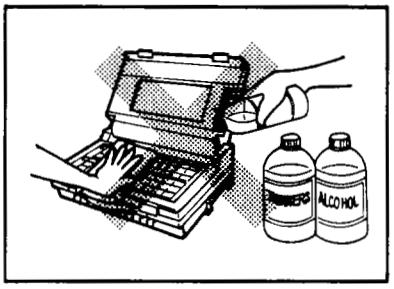
Prevent foreign objects from entering the A6HGP and ensure that the keysheet is clear before closing display panel.



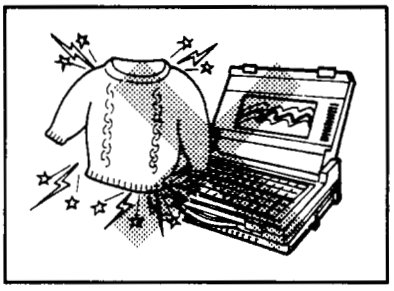
Protect the unit (particularly the LCD) and FDs from magnetic fields.



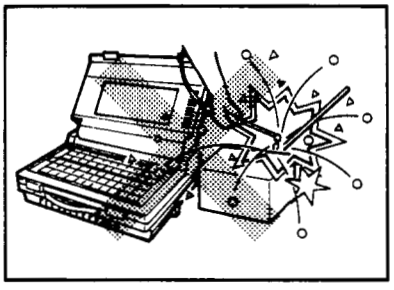
Do not submit the unit to impact.



Do not use any solvents to clean the unit.



Protect the unit and FD from static electricity.



Do not operate the unit in the vicinity of welding equipment to prevent entry of sparks.

APPENDIX 2 External Dimensions

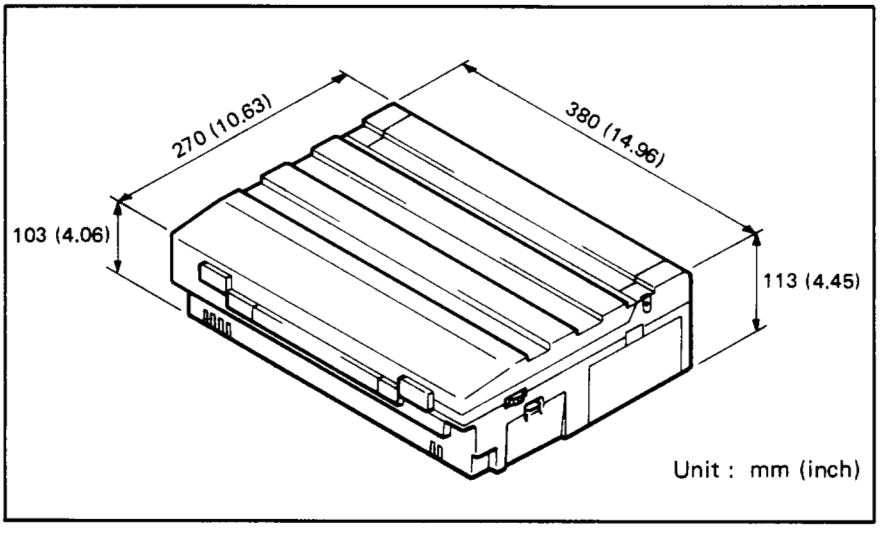


Fig. 1 Door Closed

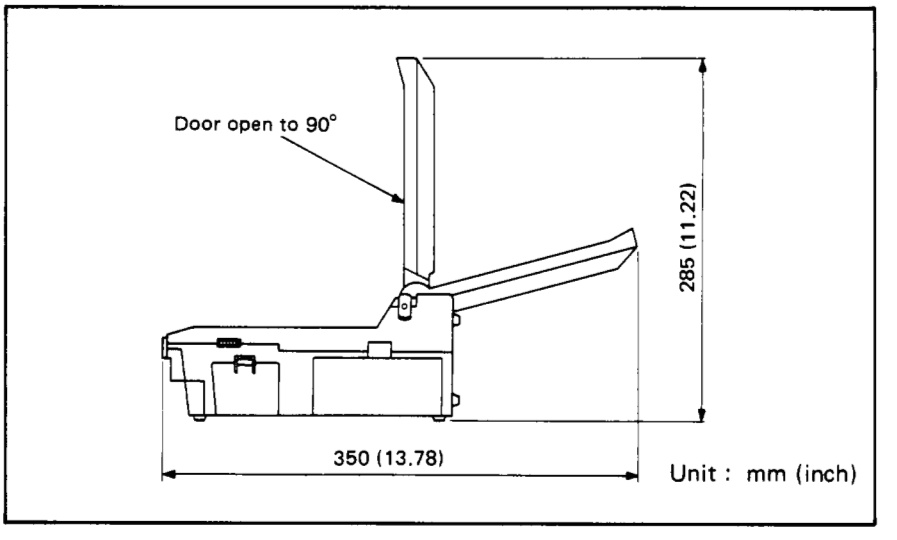


Fig. 2 Door Open

IMPORTANT

The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly. If it is necessary to handle them take the following precautions.

(1) Ground human body and work bench.

(2) Do not touch the conductive areas of the printed circuit board and its electrical parts with any non-grounded tools etc.

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.

All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.

Owing to the very great variety in possible applications of this equipment, you must satisty yourself as to its suitability for your specific application.

MITSUBISHI ELECTRIC SALES AMERICA, INC.
Industrial Automation Division
Mount Prospect, IL 60056

Printed in U.S.A.